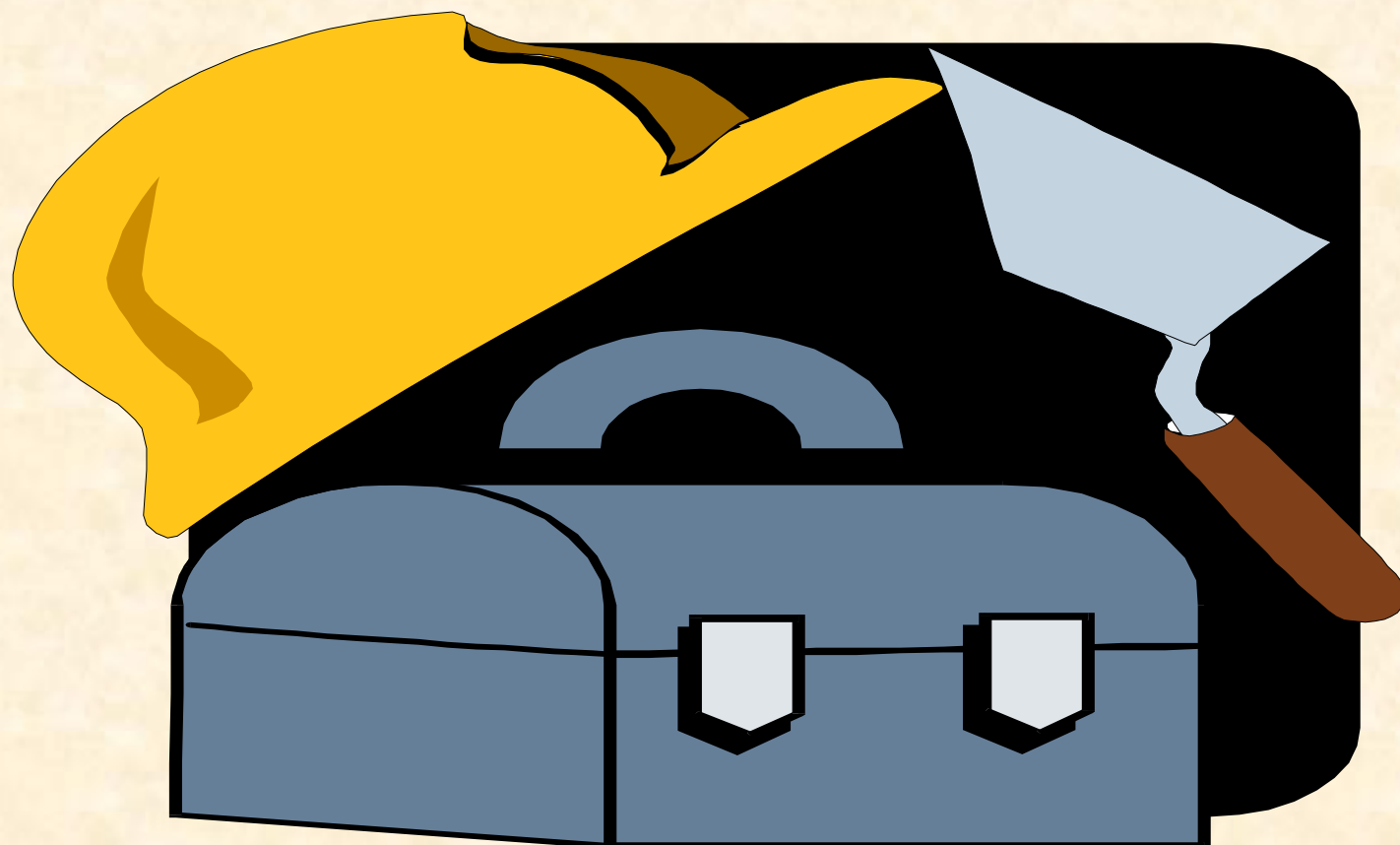


# LEAD HAZARD TRAINING

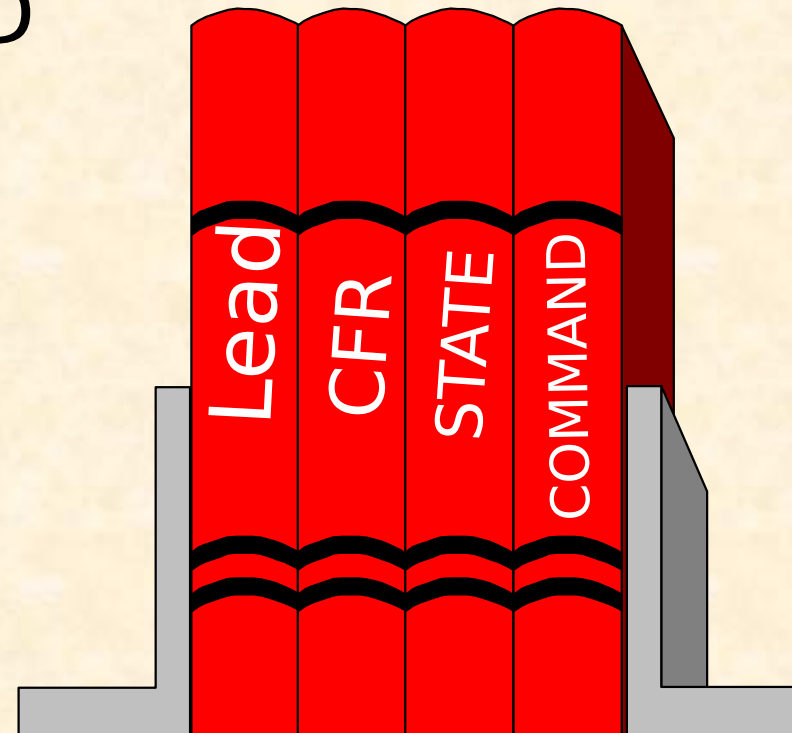
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# REFERENCES

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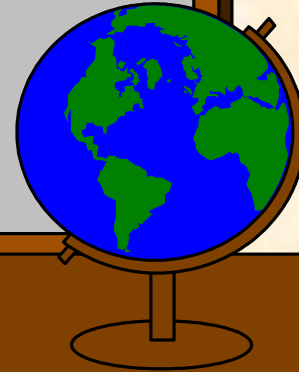
- 29 CFR 1910.1025
- OPNAVINST 5100.23D  
CHAPTER 21
- STATE LAW & LOCAL  
COMMAND



# NAVY POLICY

Prevent lead  
intoxication

and related injuries  
during the use,  
handling,



# WHAT IS LEAD?

- Lead is metallic lead, all inorganic lead compounds, and organic lead soaps.
- Some of the properties of lead that make it a useful structural material are:

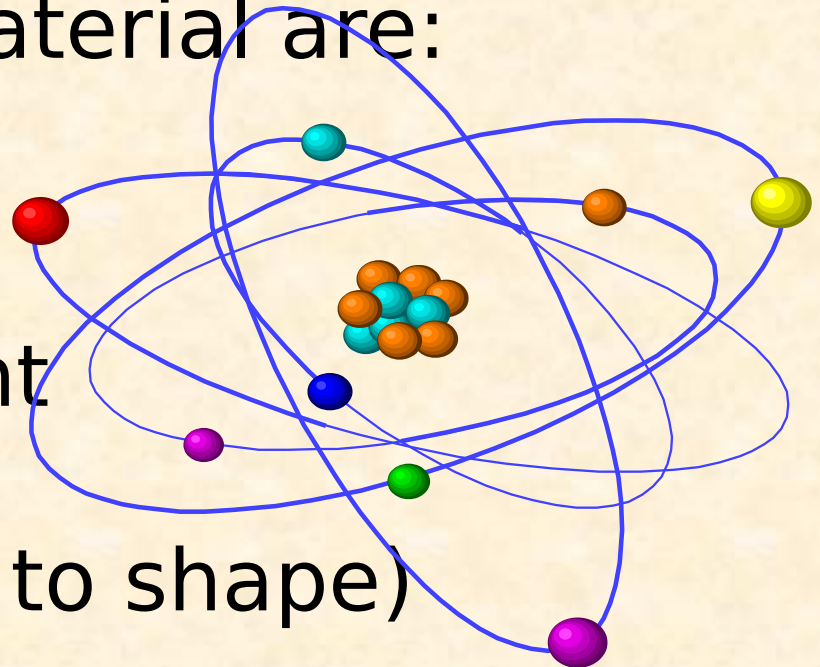
Low melting point

Very abundant

High molecular weight

High density

Very malleable (easy to shape)



# Common Uses For Lead

Batteries

Weights

shielding

Roof flashings

Pipe joints  
insulation

Ammunition

Rubber anti-oxidant

Ballast

Radiation

Paint filler

Acoustic

Solder

Lead shielding



# Operations That Can Cause Lead Exposure

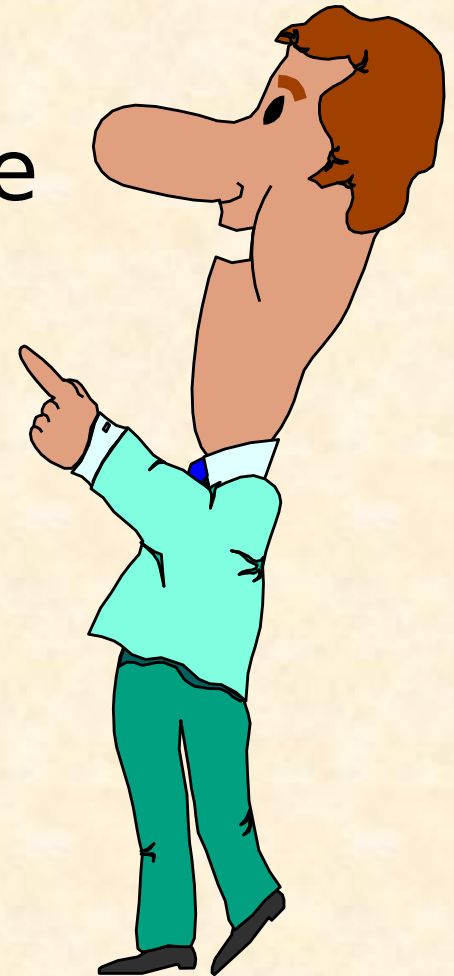
- Lead-based paint removal (most common)
- Soldering
- Grinding/sanding material containing lead
- Contaminated personal clothing
- Machining lead/lead containing metals, etc.
- Lead & babbitt melting and casting
- Lead-acid battery reclamation Ballast handling
- Leaded gasoline (less common)



# P<sub>ermissible</sub> E<sub>xposure</sub> L<sub>imits</sub>

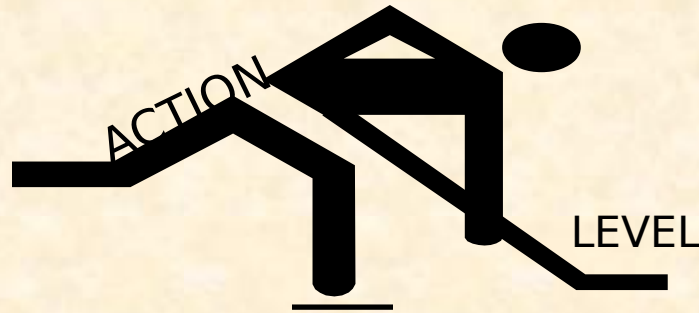
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The permissible exposure limit (PEL) for an 8 hour time weighted average (TWA) exposure to airborne lead is 50 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) of air.



# Action Level


The action level (AL) for an 8 hour TWA exposure to airborne lead is  $30 \mu\text{g}/\text{m}^3$  of air (without regard to respirator use).



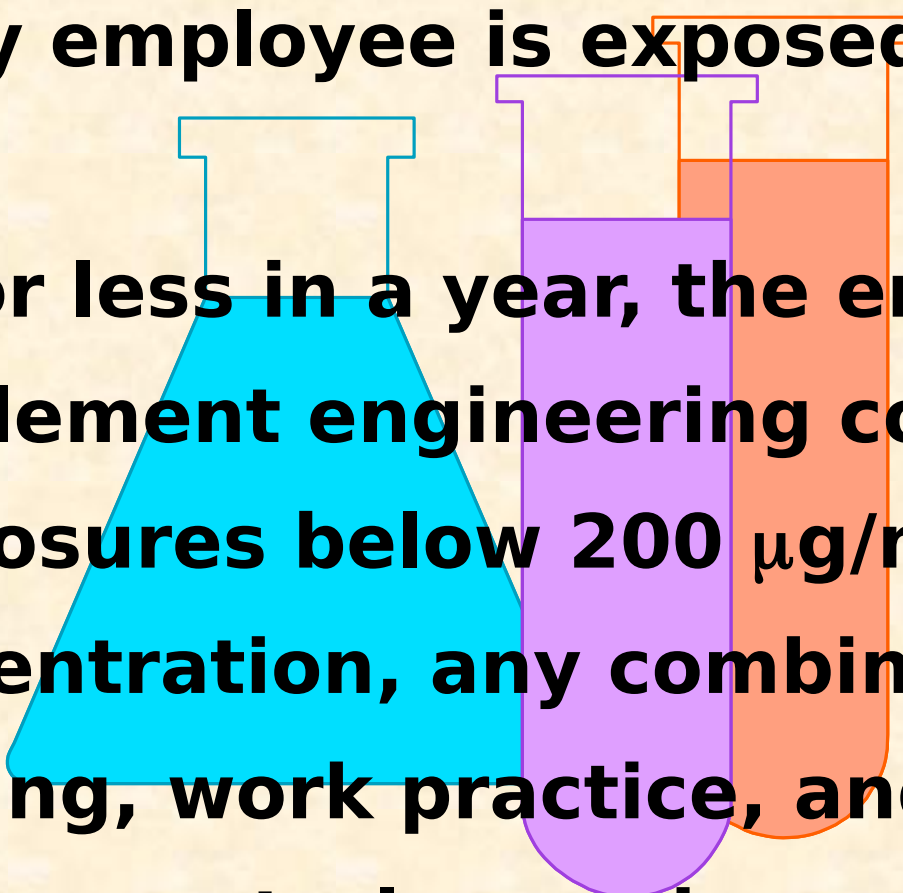
Biological monitoring and medical surveillance shall be initiated when an employee's exposure exceeds



# Exposure Limit Controls



**When any employee is exposed to lead >PEL for 30 days or less in a year, the employer shall implement engineering controls to keep exposures below  $200\ \mu\text{g}/\text{m}^3$ . Below this concentration, any combination of engineering, work practice, and respiratory controls may be used to reduce and keep employee lead exposures below**

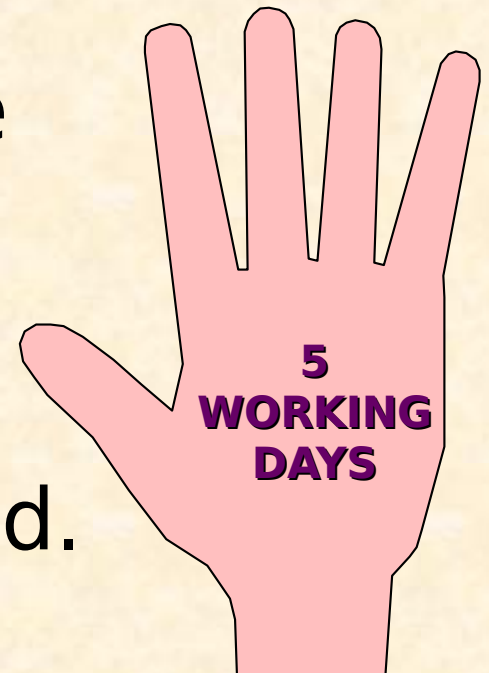


# Exceeding Exposure Limits

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Concentrations  $>$  action level - begin air monitoring, employee training, and medical surveillance.

Personnel exposed to airborne concentrations  $>$  PEL, shall be notified in writing not later than 5 working days after the test results have been received.



# How Lead Enters Your Body

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- Ingestion (most common)
- Inhalation (breathing)
- Skin absorption (least common)



# Facts about absorbed Lead

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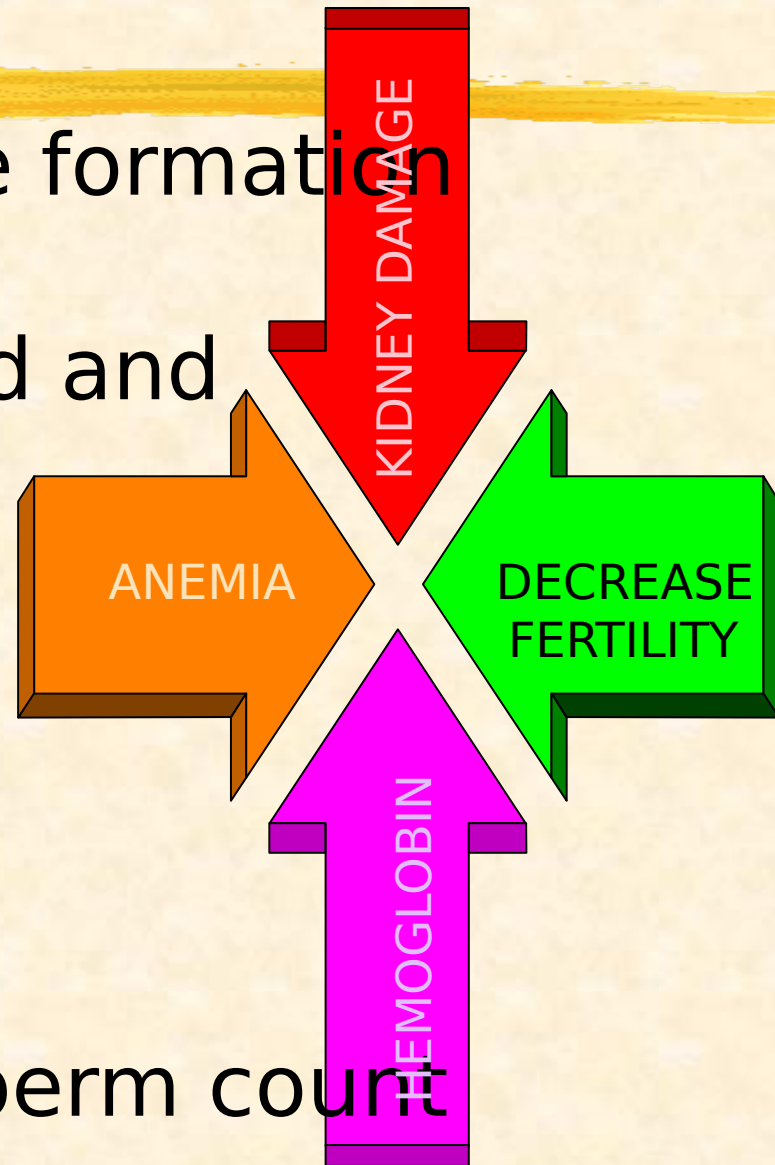
- 5 to 15% of ingested lead is absorbed by the gut.
- Only 5% of absorbed lead is retained in the blood, bone or tissue.
- The main storage site for lead is bone tissue. It takes your body 20 years to remove 1/2 of the lead stored in your bone.
- As you age, a greater percentage of absorbed lead is stored in the bone.
- Continued unprotected exposure to lead >

# HEALTH HAZARDS

Lead interferes with the formation of the hemoglobin in blood and will cause anemia.

Lead causes cellular kidney damage which leads to kidney failure.

It can cause reduced sperm count and decreased fertility.

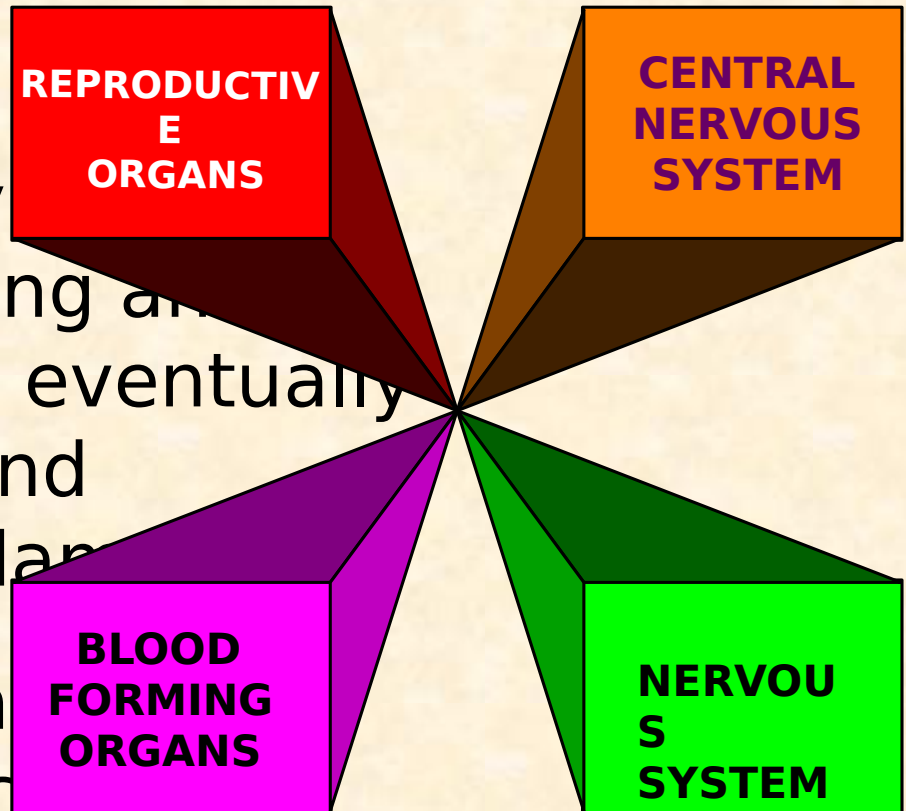


# Health Hazards cont'd

Lead can damage the nervous system, the blood forming organs, kidneys, and reproductive system.

Chronic exposure initially damages the blood forming and reproductive organs, and eventually cause peripheral nerve and central nervous system damage.

Lead can pass from mother to infant through the placenta.





# Reproductive System Effects

Exposure to lead can have serious effects on the reproductive function of both males and females.

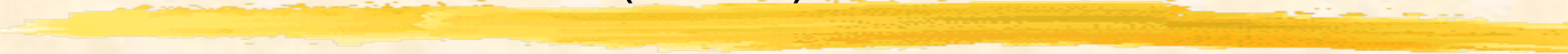
MALES -- decrease in sexual drive, impotence, decreased ability to produce healthy sperm, and sterility.

WOMEN -- menstrual disturbances including Dysmenorrhea (painful menstruation), Menorrhagia (abnormally profuse blood flow), or Amenorrhea (abnormal absence or suppression of menstrual discharge.)



# Reproductive System Effects

(cont'd)



**There is a higher frequency of sterility, premature births, spontaneous miscarriages, and stillbirths.**

**Lead can alter the structure of sperm cells raising the risk of birth defects.**

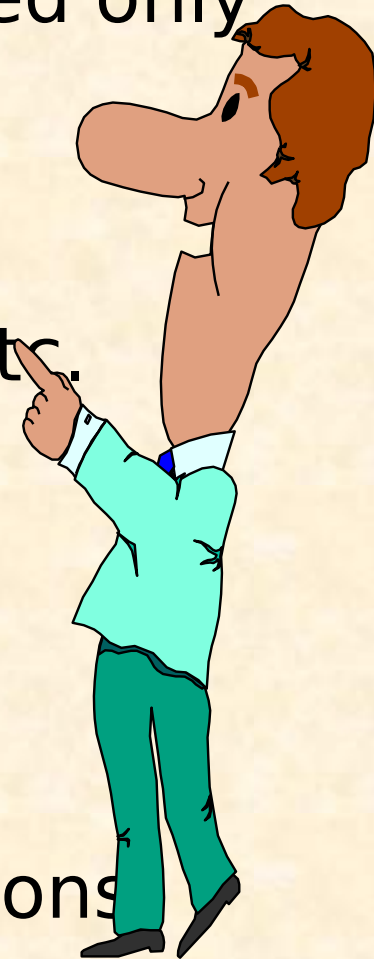
**Infants with mothers who had lead poisoning have a higher mortality rate during the first year and suffer from lower birth rates, slower growth, and**

# General Workplace Control Practices

Wet sweeping and brushing may be used only when vacuuming has been tried and found not to be effective.

Lead-containing scrap, waste, debris, etc. shall be collected, sealed, and labeled in leak-proof containers.

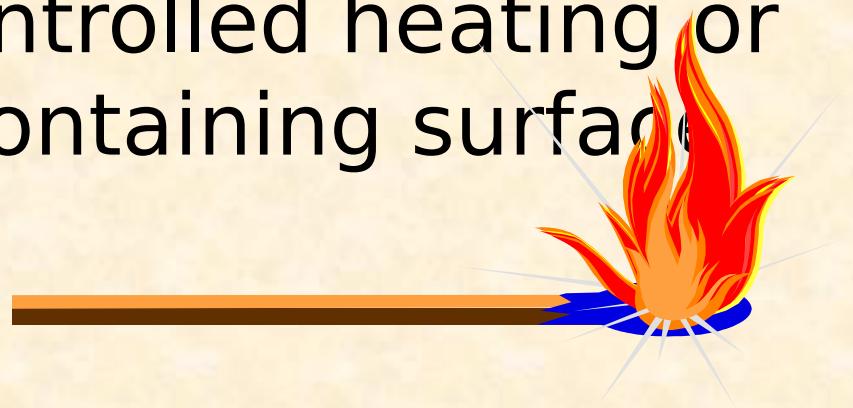
Hot work on lead and abrasive lead removal operations shall, to the extent possible, be isolated from other operations



# General Workplace Control Practices

(cont'd)

When feasible, the heating of lead and leaded materials shall be minimized through the use of controlled heating or the removal of lead-containing surface coatings prior to heating.

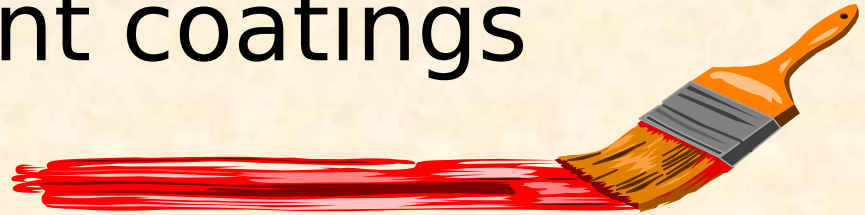


Procedures shall be established to maintain work surfaces as free of lead dust as practical. Lead dust shall be cleaned with HEPA filtered vacuum cleaners

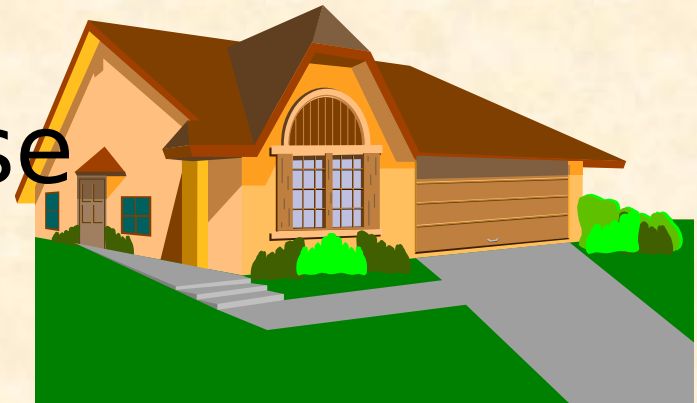
# General Workplace Control Practices

**cont'd**

Use lead-free paint coatings



Only lead-free paint ( $<0.06\%$ ) shall be used in the interior of residential structures or on other surfaces which may pose an ingestion hazard.





# VENTILATION



To the extent feasible, fixed local exhaust ventilation connected to HEPA filters or other collection systems, approved by the cognizant industrial hygienist, shall be provided at the point of airborne particulate generation.

Capture velocities shall be high enough to draw in the particulates, and the duct transport velocities shall be high enough to prevent accumulation of particulates in the duct.

Clean out points must be provided for periodic maintenance.





# VENTILATION cont'd

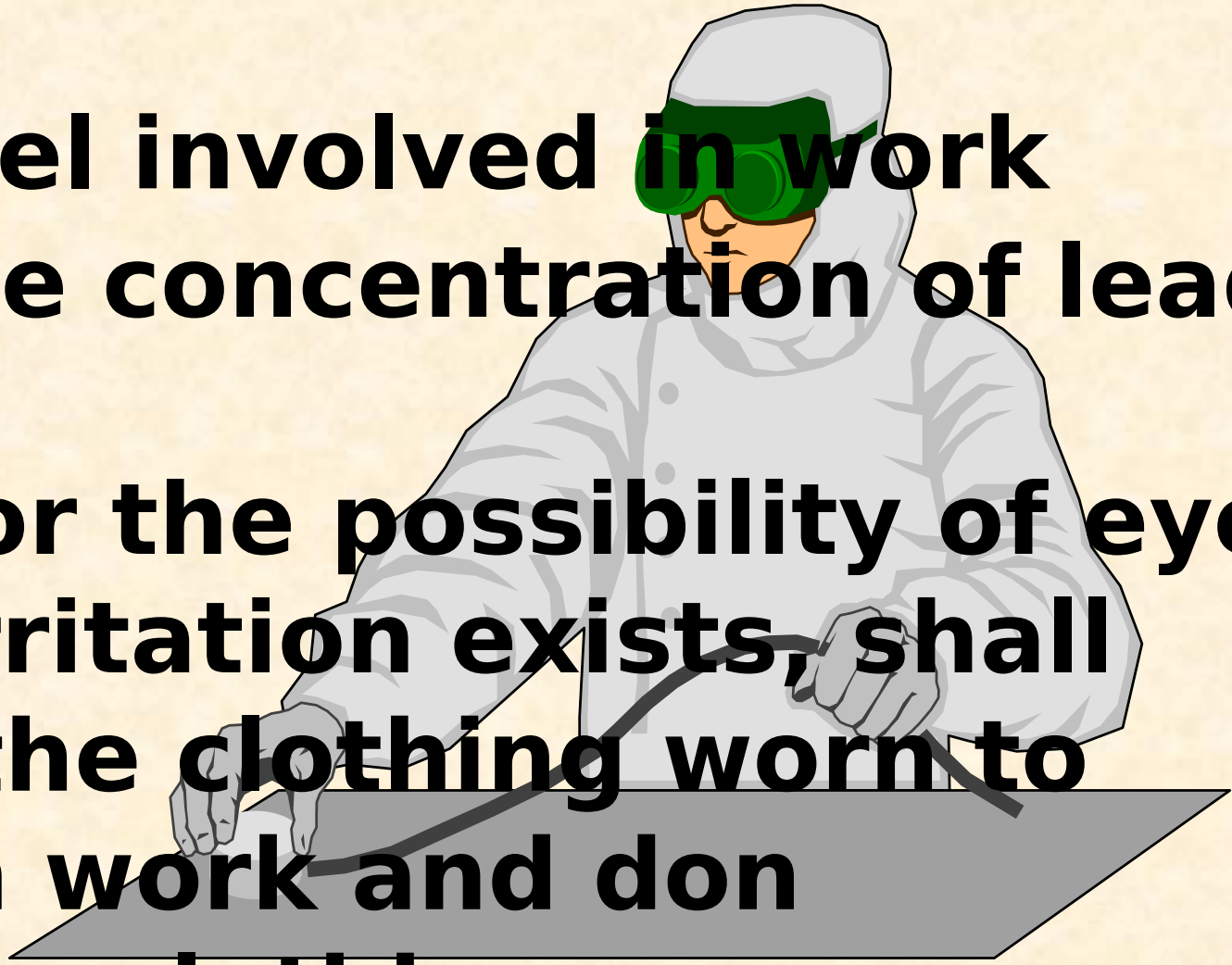
The ventilation systems shall be tested every 3 months and within 5 days of any change which may result in a change of employee exposure. Test records shall be retained for 50 years.

The re-circulation of HEPA filtered air is not recommended.




# Personal Protective Equipment

**Personnel involved in work where the concentration of lead exceeds the PEL or the possibility of eye or skin irritation exists, shall remove the clothing worn to and from work and don**



# Personal Protective Equipment cont'd



Full body, one piece coveralls supplied and laundered by the Navy or a contractor shall be used. Clothing shall be waterproof when wet lead is handled.

One piece, disposable coverall made of Tyvek or equivalent may also be used.

Durable gloves and head coverings shall be used. Hoods shall extend beyond the collar of the

# Personal Protective Equipment cont'd

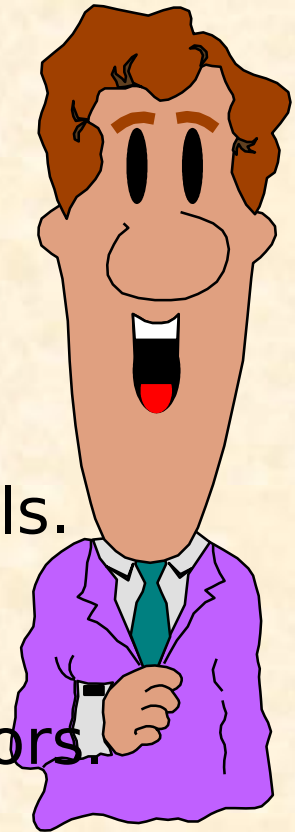
Slip resistant shoe covers or lightweight rubber boots shall be provided. Disposable shoe covers may also be used.

Face shield, vented goggles, or other appropriate protective equipment shall be provided and used whenever the possibility of eye irritation exists.

Clean protective clothing shall be provided at least weekly, or daily when the 8 hr TWA concentration exceeds 200 micrograms.

# Respiratory Protection

- Personnel identified as working in lead hazard areas shall be participants in the command's respiratory management program.
- Personnel engaged in:
  - Unventilated hot operations, where temperatures are not controlled.
  - Melting operations without thermostatic controls.
  - Unventilated indoor or outdoor spray painting operations.shall wear positive-pressure supplied-air respirators.
- Full face shields are required if lead aerosols cause eye or skin irritation.





# Respirator Fit Testing



Qualitative fit tests shall be required for all respirator users at time of initial fitting and at least annually thereafter.



# Limits of Respirator Usage

Engineering control measures shall be employed to control and contain airborne lead particulates to the lowest feasible level.

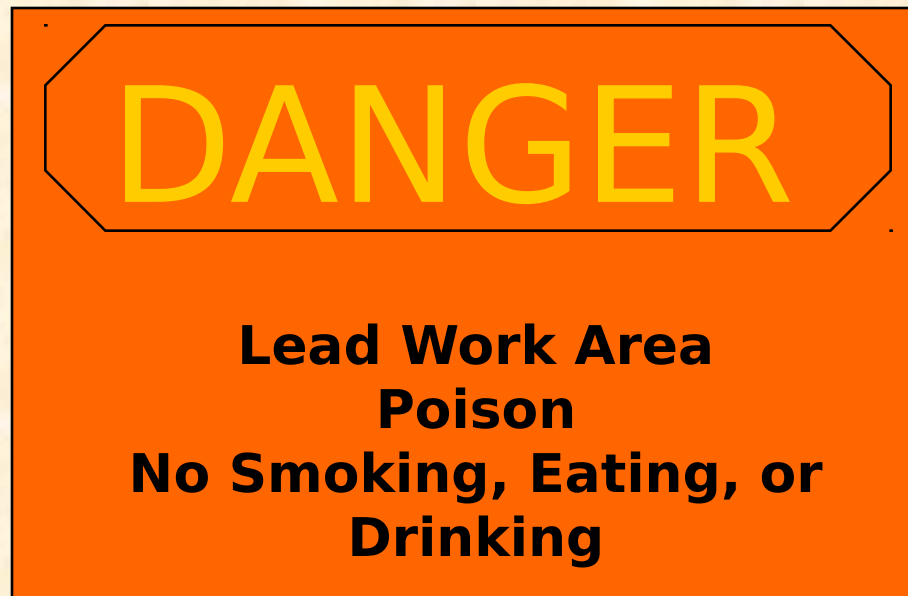


Respirators alone shall not be used to achieve compliance with PELs except in the following cases:

- During the time period necessary to implement engineering control measures.
- In work situations in which the control methods prescribed are not technically feasible, or are not sufficient to reduce the airborne concentrations to or below the PEL.
- Whenever an employee requests a respirator.

# Warning Signs

- Signs shall be provided and displayed at each location where airborne lead may exceed the PEL.



- The warning sign may contain a listing of required protective equipment.

# Caution Labels

- Affixed to containers of contaminated clothing, equipment, raw materials, waste, debris, or other products containing lead.

**CAUTION**

Clothing contaminated with lead

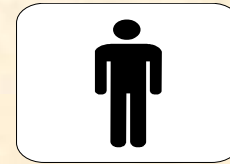
Do not remove dust by blowing or shaking

Dispose of lead contaminated wash water in  
accordance with applicable local, state,  
of federal regulations.

# Changing Facilities

(shall be provided if level exceeds PEL)

Change rooms shall be provided as close as practical to the lead work area.



There will be protective clothing removal procedures posted.



Removal of lead particles from clothing by blowing or shaking is prohibited.



Shower facilities shall be located between the

# Changing Facilities cont'd

Do not leave wearing any clothing that was worn during the work shift.

Lead contaminated clothing will be laundered by informed contractors or Navy facilities.



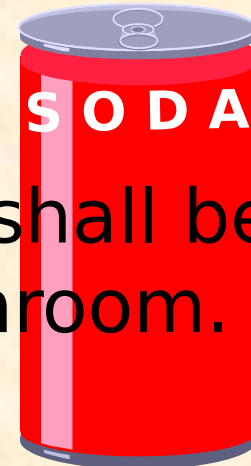
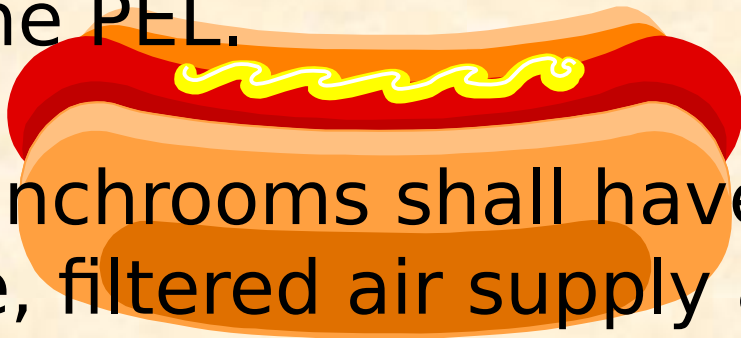
# LUNCHROOMS

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Lunchrooms shall be provided for employees who work in areas where the airborne lead exposure is above the PEL.

These lunchrooms shall have a positive pressure, filtered air supply and be readily accessible.

Protective clothing and equipment shall be removed prior to entering the lunchroom.





# LUNCHROOMS cont'd

In lead work areas, the following shall be prohibited:

- Eating
- Drinking
- Chewing or smoking tobacco
- Applying makeup
- Storage of food or tobacco



All lead workers shall wash their hands and face prior to eating, drinking, smoking, or applying cosmetics.

# Medical Program

**The program consists of 3 basic elements:**

- Pre-placement medical evaluation.

All personnel shall receive a pre-placement evaluation prior to assignment to a position involving potential exposure to lead that equals or exceeds the AL.

- Semi-annual

Blood lead monitoring unless air monitoring indicates exposures above the action level for more than 30 days per year.

- Follow-up medical evaluations

Blood lead analysis based on the results of blood lead analysis and physician's opinion.

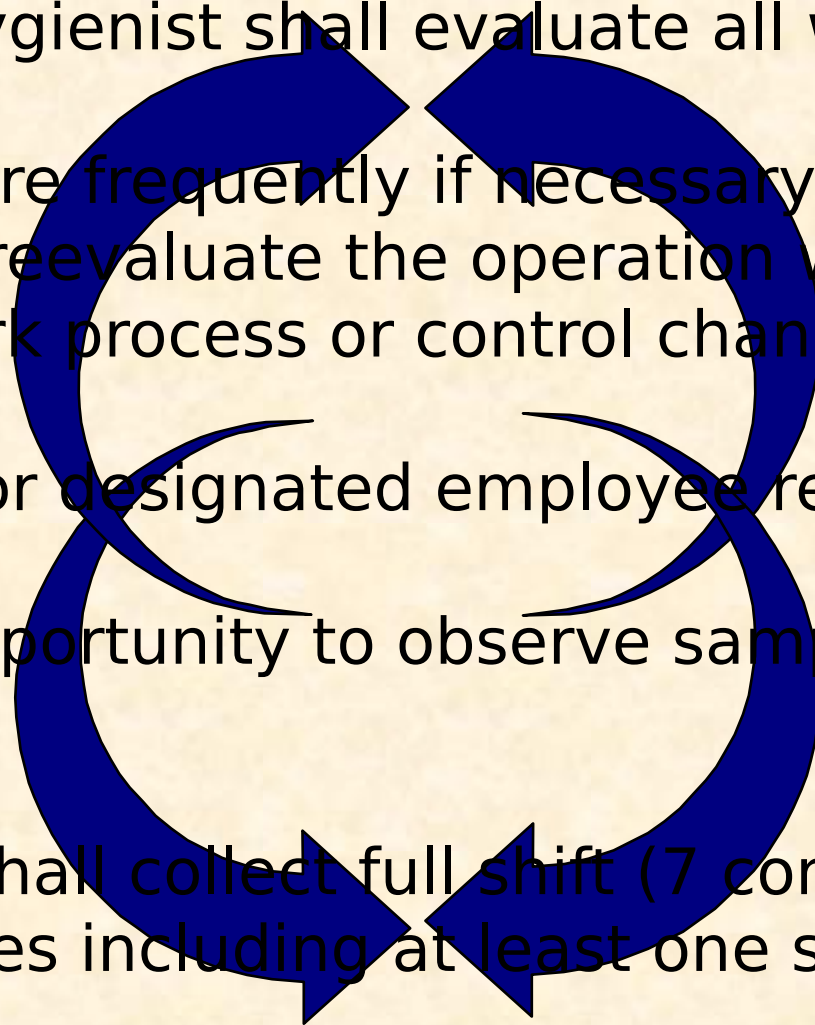
# Workplace Monitoring Plan



An Industrial Hygienist shall evaluate all workplaces at least annually, or more frequently if necessary, where lead is used and shall reevaluate the operation within 5 working days of any work process or control change.

The employee or designated employee representative shall be given the opportunity to observe sampling or monitoring.

The employer shall collect full shift (7 continuous hours) personal samples including at least one sample for each shift,



# TRAINING

All Navy personnel who work in areas where the potential exists for lead exposure  $\geq$  the AL shall receive:

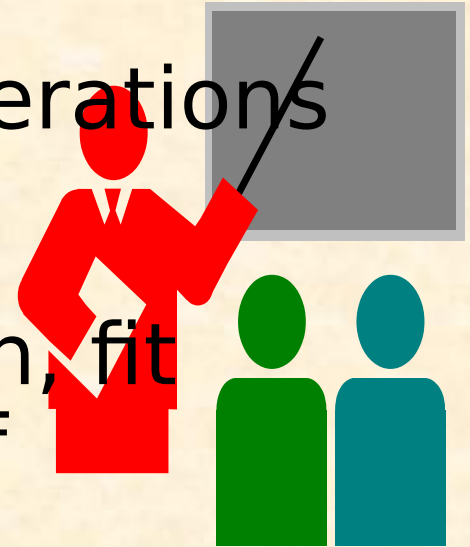
- Initial training upon assignment
- Annual training thereafter



# T r a i n i n g cont'd

The minimum lead hazard training will consist of:

- The specific nature of the operations where lead is possible.
- The purpose, proper selection, fit testing, use, and limitations of respirators.
- Contents of commands' compliance plan.





# TRAINING cont'd



- The adverse health effects of lead with particular attention to the reproductive effects upon both males and females.
- The purpose and description of the medical surveillance program, including the use of chelating agents.
- The engineering controls and work practices to be applied and used in the employee's job, including personal protective equipment and personal hygiene measures.

**All affected employees shall have access to a copy of 29 CFR 1910.1025 "Lead Standard"**